

## Improved Particle Swarm Optimization with Cellular Automata and Fuzzy Cellular Automata

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**Abstract :** The particle swarm optimization are Meta heuristic optimization method, which are used for clustering and pattern recognition applications are abundantly. These algorithms in multimodal optimization problems are more efficient than genetic algorithms. A major drawback in these algorithms is their slow convergence to global optimum and their weak stability can be considered in various running of these algorithms. In this paper, improved Particle swarm optimization is introduced for the first time to overcome its problems. The fuzzy cellular automata is used for improving the algorithm efficiently. The credibility of the proposed approach is evaluated by simulations, and it is shown that the proposed approach achieves better results can be achieved compared to the Particle swarm optimization algorithms.

**Keywords :** cellular automata, cellular learning automata, local search, optimization, particle swarm optimization

**Conference Title :** ICCSET 2015 : International Conference on Computer Science, Engineering and Technology

**Conference Location :** Istanbul, Turkey

**Conference Dates :** February 16-17, 2015